

## CLAIMS

What is claimed is:

1. A low shock separation joint for coupling a first structure to a second structure comprising:
  - a male member having a first major surface and a second major surface wherein at least one projection is formed on said first and second major surface;
  - a female member having a first flange and a second flange wherein at least one projection is formed on said first and second flange, wherein surfaces of said at least one projection on said first and second flange are respectively mated to surfaces of said at least one projection on said first and second major surface of said male member to prevent separation of the separation joint under tensile and compressive forces; and
  - an explosive device placed within a cavity of said female member.
2. The low shock separation joint as recited in claim 1 wherein said female member further includes a mount for attachment to the first structure.
3. The low shock separation joint as recited in claim 2 wherein said female member comprises a first and a second half structure wherein said first half structure includes said first flange, wherein said second half structure includes said second flange, and wherein said first and second flanges oppose one another when the first and second half structures are coupled together.
4. The low shock separation joint as recited in claim 3 wherein a clevis is formed for receiving the first structure when said first and second half structures of said female member are coupled together and wherein said clevis comprises a portion of both said first and second half structures of said female member.

5. The low shock separation joint as recited in claim 4 wherein said male member is place between said first and second flange and wherein fastening the first structure to the clevis of female member couples said female member to said male member.

6. The low shock separation joint as recited in claim 5 wherein surfaces of said at least one projection of said first and second flange mated respectively to surfaces of said at least one projection of said first and second major surface of said male member are non-locking.

7. The low shock separation joint as recited in claim 6 wherein said explosive device when detonated bends said first and second flange away from said male member and wherein first and second flange move in an arc away from said male member.

8. The low shock separation joint as recited in claim 1 wherein said explosive device has a first volume within said cavity of said female member prior to detonation, wherein said explosive device has a second volume after detonation, and wherein said second volume is greater than said first volume.

9. The low shock separation joint as recited in claim 7 wherein said explosive device includes an expandable housing around an explosive material and wherein said expandable housing does not rupture when said explosive material is detonated.

10. The low shock separation joint as recited in claim 1 wherein the male member further includes a mount for attachment to the second structure.

11. The low shock separation joint as recited in claim 1 wherein said female member comprises a deformable metal.

12. A method for reducing shock in an explosive separation joint comprising the steps of:

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coupling a male member to a female member such that surfaces on said male member are in intimate contact with corresponding surfaces on said female member such that said surfaces on the male and female member prevent separation of the separation joint under tensile and compressive forces;

detonating an explosive device in a female member of the separation joint; and

expanding a housing of said explosive device from a first volume to a second volume; and

using a volume increase of said explosive device to bend flanges of said female member away from one another wherein surfaces in intimate contact are moved out of contact with one another to decouple said male member from said female member.

13. The method for reducing shock in an explosive separation joint as recited in claim 12 further including a step of angling said surfaces on said male member and the female member such that they are non-locking.

14. The method for reducing shock in an explosive separation joint as recited in claim 12 further including a step of holding surfaces on said male member in intimate contact with corresponding surfaces on said female member by fastening said female member to a structure.

15. The method for reducing shock in an explosive separation joint as recited in claim 14 further including a step of bending said first and second flanges in an arc away from one another.

16. A method of assembling an explosive separation joint comprising:

providing a male member of the separation joint;

providing an explosive device;

aligning a first half structure of a female member of the separation joint to the male member and said explosive device;

aligning a second half structure of said female member of the separation joint to the male member and said explosive device; and

fastening the first half structure to said second half structure.

17. The method of assembling an explosive separation joint as recited in claim 16 further including the steps of:

placing a first structure in a clevis formed by placing said first and second half structure together; and

bolting said first structure to said clevis to rigidly fasten said male member to said female member.

18. The method of assembling an explosive separation joint as recited in claim 17 further including a step of housing said explosive device in a cavity formed when said first and second half structure are placed together.

19. The method of assembling an explosive separation joint as recited in claim 18 further including the steps of:

aligning projections on a first major surface of said male member to projections on said first half structure;

aligning projections on a second major surface of said male member to projections on said second half structure;

mating surfaces of said projections on said first major surface of said male member to surfaces on said first half structure; and

mating surfaces of said projections on said second major surface of said male member to surfaces on said second half structure.

20. The method of assembling an explosive separation joint as recited in claim 19 further including a step of fastening a second structure to a flange on said male member.